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10/565,582	07/10/2006	Mark Bischoff	3081.154WOUS	2301
24113 7590 10/27/2010 PATTERSON THUENTE CHRISTENSEN PEDERSEN, P.A. 4800 IDS CENTER 80 SOUTH 8TH STREET MINNEAPOLIS, MN 55402-2100				
EXAMINER EVANS, GEOFFREY S				
ART UNIT		PAPER NUMBER		
3742				
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10/27/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/565,582

Applicant(s)

BISCHOFF ET AL.

Examiner

Geoffrey S. Evans

Art Unit

3742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 30-66 is/are pending in the application.
- 4a) Of the above claim(s) 36-47, 50, 58 and 59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 30-35, 48, 49, 51-57 and 60-66 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08/10/2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. In the previous office action Some in U.S. Patent No. 7,359,045 was used. The replacement drawings of 10 August 2010 are acceptable.
2. Claims 36-47,50 and 58-59 remain withdrawn from consideration.
3. Claims 53-62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how claim 53 further limits claim 30 and whether claim 53 is a hybrid claim. Please remove any reference to claim 30 in claim 53. Claims 54-62 are indefinite solely because they depend from claim 53.
4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 30,31-33,35,53,54, 55 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neev in U.S. Patent No. 6,482,199 in view of Some in U.S. Patent No. 7,359,045 and the article on Laser Beam Machining on pages 234-245 "Wiley Encyclopedia of Electrical and Electronics Engineering", Webster (ed), hereinafter referred to as "Webster". Neev discloses a method of material processing with laser pulses that can be as small as 1 femtosecond (see column 8, line 30) to as large as 10 milliseconds (see column 8, line 31) and adjusting the pulse parameters before or during the process (see column 6, lines 31-65) and further that the pulse parameter can be the pulse duration (see column 10, lines 2-3). Some teaches that laser pulses that are femtoseconds and picoseconds have large spectral bandwidth (see column 2, lines 50-52). Webster teaches on page 238 (first full paragraph) that spectral bandwidth is an issue when ultimate performance is required due to the problem of chromatic aberration, which must be minimized for ultimate performance. It would have been obvious to adapt Neev in view of Some and Webster to reduce the spectral bandwidth of the laser beam to reduce chromatic aberration caused by the large spectral bandwidth of the laser beam passing through a focusing lens. Regarding claim 31, adjusting the pulse width also changes the heat effected zone and hence the surface structuring. Regarding claim 35, Neev discloses adjustment during the process (see column 6, lines 58-65) and therefore is considered to be dynamic. Regarding claim 53, the optical elements in element 420 (especially the pulse stretcher (element 426), the regenerative amplifier (elements 430,434) and the pulse compressor (element 436)) are considered to be a pulse shaper that sets the pulse duration and hence the

spectral distribution of amplitude. Regarding claim 54, see the regenerative amplifier (elements 430 and 434) of Neev. Regarding claim 55, Neev further discloses a measurement unit (a feedback transducer, element 1472, see column 55, line 35 to column 56, line 12) and a control unit (a laser controller, element 1478, see column 56, lines 11-12)

7. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neev in view of Some and Webster as applied to claim Stuart et al. in U.S. Patent No. 6,268,586. Stuart et al. teach adjusting the polarization of a laser beam with pulses preferably shorter than 10 picoseconds (see column 5, line 23) for improving the quality of the machining. It would have been obvious to adapt Neev in view of Stuart et al. to provide this to improve the quality of the edges being processed (see abstract of Stuart et al.) .

8. Claims 48,49,56,57 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neev in view of Some and Webster as applied to claims 35 and 55 and further in view of Detalle et al. in U.S. patent No. 6,532,068. Detalle et al. teach monitoring the spectrum of plasma with an optical sensor, i.e. a grating spectrometer (see column 5, lines 21-39). It would have been obvious to adapt Neev in view of Some, Webster and Detalle et al. to provide this to determine the concentration of a material being ablated.

9. Claims 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neev in view of Some and Webster as applied to claim 30, and further in view of Thompson et al. in U.S. Patent No. 6,195,164. Thompson teaches preliminary

calibration of a laser by previously using a test surface (workpiece). It would have been obvious to adapt Neev in view of Some, Webster and Thompson to provide this to adjust the pulse width to the desired amount which would inherently adjust the spectral bandwidth and to use this as a starting parameter as a matter of quality control.

10. Claim 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over Neev in view of Some and Webster as applied to claim 53 and further in view of Lai in U.S. Patent No. 5,984,916. Lai teach using a femtosecond laser to ablate a cornea. It would have been obvious to adapt Neev in view of Lai to modify Neev as required to process human eye tissue.

11. Claims 62,64,65 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Neev in view of Some and Webster as applied to claims 53 and 63, and further in view of Hacker et al. in the article "Micromirror SLM for femtosecond pulse shaping in the ultraviolet". Hacker et al. teach pulse shaping a femtosecond pulse by phase modulation (see column 3 of page 711) using a micromirror SLM. It would have been obvious to adapt Neev in view of Some, Webster, and Hacker et al. to provide this to programmably adjust the phase modulation of the laser beam by suitable programming of the controller of the micromirror SLM (i.e. the micromechanical system MEMS).

12. Applicant's arguments filed 10 August 2010 have been fully considered but they are not persuasive. The laser pulses in Neev that are femtosecond pulses or picosecond pulses have large spectral bandwidth.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Moon et al. in U.S. Patent No. 2002/0176151 discloses using an array of micromirrors to filter wavelength bands of light. Amako et al. in U.S. Patent Application Publication No. 2003/0052102 discloses in paragraphs 8-12 the problem of focusing femtosecond laser pulses because of their large wavelength band (i.e. large spectral bandwidth) and the problem of chromatic aberration.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey S. Evans whose telephone number is (571)-272-1174. The examiner can normally be reached on Mon-Fri 7:00AM to 3:30 PM (flexible).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on (571)-272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Geoffrey S Evans/  
Primary Examiner, Art Unit 3742